

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (currently amended) An isolated, purified or recombinant nucleic acid sequence comprising:

(a) a sequence of SEQ ID NO: 1 that encodes the an apophotoprotein of pholasin (alternatively, 'apopholasin');

(b) a sequence substantially homologous to at least 70% homologous to SEQ ID NO: 1 or that a sequence that hybridises to sequence (a) SEQ ID NO:1 under stringent conditions; or

(c) a sequence substantially homologous to or that hybridises under stringent conditions to the sequence (a) or (b) but for the degeneracy of the genetic code; or

(d) an oligonucleotide specific for any of the sequences (a), (b) or (c) an oligonucleotide specific for any of the sequences specified in (a) or (b).

2-3. (cancelled)

4. (currently amended) A pholasin protein encoded by a sequence according to claim 1, wherein the apopholasin pholasin is non-glycosylated.

5. (currently amended) A pholasin protein encoded by a sequence according to claim 1, wherein the apopholasin pholasin is glycosylated.

6. (currently amended) An isolated, purified or recombinant construct incorporating a sequence encoding apopholasin protein according to any preceding claim 1.

7. (currently amended) An isolated, purified or recombinant construct incorporating a sequence encoding an apophotoprotein whose of SEQ ID NO: 1, that encodes a pholasin protein, wherein the expression of said protein in a substrate, when in association with a luciferin therefor, signals the presence of oxygen or an oxygen metabolite in the substrate by producing a light signal.

8. (cancelled)

9. (currently amended) A recombinant construct comprising a nucleic acid according to claim 1, wherein the nucleic acid sequence is linked operably with nucleotides enabling expression and secretion of [[the]] apopholasin in a cellular host.

10. (previously presented) DNA or RNA according to claim 1.

11-14. (cancelled)

15. (currently amended) A cell, plasmid, virus or live invertebrate organism having incorporated expressibly therein a

sequence according to claim 1, whereby it is capable of producing an apoprotein.

16. (previously presented) A vector comprising a sequence according to claim 1.

17. (original) A host cell transformed or transfected with a vector according to claim 16.

18-30. (cancelled)

31. (new) A method for detecting, diagnosing, or measuring oxygen or a metabolite in a substrate, comprising:

exposing the substrate to a protein encoded by the nucleic acid according to claim 1, either in the presence or absence of luciferin, and detecting bioluminescence from said protein when oxygen or an oxygen metabolite is present.

32. (new) An isolated, purified or recombinant nucleic acid sequence comprising SEQ ID NO: 1.

33. (new) An isolated, purified or recombinant construct incorporating a sequence according to claim 32.